Space Weather Forecast

Issued on Friday, 23 September 2022 at 01:27 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

Space Weather Forecast Headline: Chance of R1-R2 Radio Blackouts throughout. Minor Geomagnetic Storm intervals expected today with a chance of a moderate storm interval.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar activity remained at Low levels over the past 24 hours, with frequent Common class flares. The largest flare was observed from AR3105 at 22/1134UTC, which continues to be the largest region on the visible disc. There are four other sunspot regions on the disc, which are small to moderate in size and complexity, and generally stable, only two regions showing a slight growth.

A filament eruption occurred from near the northeastern limb around 22/0200UTC. Then a faint CME began to appear in imagery, around 22/0720 UTC, the source of which is uncertain. Currently both CME's are not expected to be Earth directed.

Solar Wind / Geomagnetic Activity: The solar wind initially declined from slightly elevated levels to background levels, but then through the evening gradually returned to slightly elevated levels around 440 km/s. The overall strength of the magnetic field was weak and stable until 22/2059 UTC when a jump to moderate levels occurred. The north-south component was predominantly positive, but had occasional weak southward fluctuations. The corresponding geomagnetic activity was Quiet until the end of the day, then becoming Unsettled.

Energetic Particles / Solar Radiation: Solar radiation remained very close to typical low Background levels.

Four-Day Space Weather Forecast Summary

Solar Activity: Solar activity is forecast to be low to moderate, with further common-class flares expected and a with an ongoing chance of moderate-class flares. The main flare risk remains from the southeastern quarter of the Sun. Towards the end of the forecast period new regions are likely to rotate onto the visible disc, potentially increasing the solar activity.

Solar Wind / Geomagnetic Activity: After starting at slightly elevated levels the solar wind is expected to increase this morning with the arrival of an enhanced solar wind from a large coronal hole feature. The solar wind is likely to temporarily, and only slightly, decline in the speed during day 3 (25th), before a further enhancement possibly occurs during day 4 (26th) under the influence of another coronal hole feature.
Today activity is expected to increase to Active to Minor Storms, with a Chance for Moderate Storm intervals. Conditions should then provisionally ease Quiet to Active for tomorrow, and Quiet to Unsettled for day 3 (25th), before becoming Unsettled to Active again for day 4 (26th). However, later day 3 (25th) geomagnetic activity may increase Active to Minor Storm due to a

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glancing blow from the 21st Sept Coronal Mass Ejection, although confidence is low.

Energetic Particles / Solar Radiation: No solar radiation storms are expected.

Geomagnetic Storms:

Geo-Magnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	80	40	30	10
Strong	G3	No	5	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 M Class	No	30	30	30	30
Very Active	R3 to R5 X	No	5	5	5	5

Solar Radiation Storms - (High Energy Protons):

Radiation Storms Probability (Exceedance)	Level (cm^{-2} sr^{-1} s^{-1})	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	≥ S1	No	2	2	2	2
Very Active	≥ S3 *	No	1	1	1	1
* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)						

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